2012 National CFAR Symposium Early Career Investigator Nomination

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Position Title  Assistant Professor, Division of Infectious Diseases

Title of Nominated Scientific Presentation:

Differences in α4β7 Expression on CD4+ T cells among Black and White HIV-negative Men who Have Sex with Men (MSM)

Abstract

**Background:** HIV incidence among black MSM is at least 2-3 fold higher than white MSM and has not been explained by differences in risk behavior such as number of sex partners, unprotected anal intercourse, or drug use. Differences in immunologic factors could influence susceptibility to HIV among MSM. We present preliminary data on HIV target cell availability among black and white MSM focused on CCR5+ and α4β7+ (the ‘gut-homing’ receptor on leukocytes and a co-receptor for HIV) on CD4+ T cells.

**Methods:** The Emory InvolveMENt study is an ongoing longitudinal cohort of black and white MSM in Atlanta aged 18-40 designed to evaluate individual, dyadic, and community level factors that contribute to the disparity in HIV incidence. We used 4-color flow cytometry (FACSCalibur) on peripheral blood to examine CCR5 and β7 (a marker for α4β7) on CD4+ T cells and T cell activation (HLA-DR+CD38+) in a cross sectional sample of 23 black and 47 white HIV-negative MSM. Participants were tested for urethral *Chlamydia* and *Gonorrhoaea* infection (STI) by urine NAAT and for syphilis and HSV-2 by serology. Behavioral risk factors were assessed by questionnaire. Median percentages of CD4+CCR5+ and CD4+β7+ T cells and mean fluorescence intensity (MFI) and percentage of activated CD4+ and CD8+ T cells were compared between black and white MSM with the Wilcoxon rank-sum test.

**Results:** There was no significant difference in peripheral expression of CCR5 on total CD4+ T cells among black and white MSM (median 6% vs. 8% p=.06, median MFI 98.5 vs. 93 p=.6) or in percentage of HLA-DR+CD38+CD4+ (median 0.4% vs. 0.4% p=.71) or CD8+ T cells (median 1.2% vs. 1.3% p=.74). However, black MSM had a significantly higher percentage of CD4+β7+ T cells (median 39% vs. 30% p=.0001) and higher density of β7 on CD4+ T cells (median MFI 192 vs. 151 p=.01) than white MSM. These findings were not associated with differences in urethral STI, syphilis, HSV-2 seropositivity, age, condom use, or number of anal intercourse partners.

**Discussion:** Despite similarities in peripheral CCR5 expression, higher expression of α4β7+ on CD4+ T cells among black MSM as compared to white MSM could indicate greater trafficking of HIV target cells to gut mucosa. Since rectal exposure accounts for ~75% of HIV infections in MSM, a more ‘target rich’ environment in the rectal mucosa of black MSM may contribute to profound disparities in HIV acquisition. Further studies are ongoing to examine this unexpected finding.